

A2 CCI Review Key Q2 T2

$$1) \frac{h-20}{h^2-16} + \frac{2}{h-4} = \frac{h-20}{(h+4)(h-4)} + \frac{2}{h-4} \quad \text{LCD: } (h+4)(h-4)$$

$$\frac{h-20}{(h+4)(h-4)} + \frac{2(h+4)}{(h+4)(h-4)} = \frac{h-20+2h+8}{(h+4)(h-4)} = \frac{3h-12}{(h+4)(h-4)} = \frac{3(h-4)}{(h+4)(h-4)}$$

$$= \boxed{\frac{3}{h+4}}$$

$$2) \frac{2}{x-3} + \frac{4}{3-x} = \frac{2}{x-3} + \frac{-4}{x-3} = \boxed{\frac{-2}{x-3}}$$

$$3) \frac{3}{x^2-16} + \frac{2}{x^2-4x}$$

$$\text{LCD: } x(x-4)(x+4)$$

$$\frac{3}{(x-4)(x+4)} + \frac{2}{x(x-4)} = \frac{3x}{x(x-4)(x+4)} + \frac{2(x+4)}{x(x-4)(x+4)} = \frac{3x+2x+8}{x(x-4)(x+4)} = \boxed{\frac{5x+8}{x(x-4)(x+4)}}$$

$$4) \frac{4}{x^2+4x-5} - \frac{3}{x^2-1}$$

$$\text{LCD: } (x+5)(x+1)(x-1)$$

$$\frac{4}{(x+5)(x-1)} - \frac{3}{(x+1)(x-1)} = \frac{4(x+1)}{(x+5)(x-1)(x+1)} - \frac{3(x+5)}{(x+5)(x+1)(x-1)}$$

$$\frac{4x+4-3x-15}{(x+5)(x+1)(x-1)} = \boxed{\frac{x-11}{(x+5)(x+1)(x-1)}}$$

$$\text{LCD: } a^2 b^2$$

$$5) \frac{a-2b}{a^2 b} - \frac{a+b}{ab^2}$$

$$\frac{b(a-2b)}{a^2 b^2} - \frac{a(a+b)}{a^2 b^2} = \frac{ab-2b^2-a^2-ab}{a^2 b^2} = \boxed{\frac{-2b^2-a^2}{a^2 b^2}}$$

$$6) \left(\frac{1}{a} - \frac{1}{b} \right) \frac{\text{LCD: } ab}{ab} = \frac{b-a}{ab}$$

$$\left(\frac{1}{b^2} - \frac{1}{a^2} \right) \frac{\text{LCD: } a^2 b^2}{a^2 b^2} = \frac{a^2-b^2}{a^2 b^2} \Rightarrow \frac{b-a}{ab} \cdot \frac{a^2 b^2}{a^2-b^2}$$

$$\frac{\cancel{b-a}}{ab} \cdot \frac{a^2 b^2}{(a+b)(\cancel{a-b})} = \boxed{\frac{-ab}{a+b}}$$

$$7) \left(\frac{1}{1} - \frac{1}{x} \right) \frac{\text{LCD: } x}{x} = \frac{x-1}{x}$$

$$\left(\frac{x-2}{1} + \frac{1}{x} \right) \frac{\text{LCD: } x}{x} = \frac{x^2-2x+1}{x}$$

$$\frac{\cancel{x-1}}{x} \cdot \frac{x}{(x-1)(x-1)} = \boxed{\frac{1}{x-1}}$$

$$\text{LCD: } 2a(a+b)$$

$$8) \frac{1}{2a} - \frac{9}{a^2+ba} = \frac{2-a}{2a+12}$$

$$\frac{a+b}{2a(a+b)} - \frac{9(2)}{2a(a+b)} = \frac{(2-a)a}{2a(a+b)}$$

$$a+b-18 = 2a-a^2$$

$$a-12 = 2a-a^2$$

$$\frac{a^2-2a}{a^2-2a} = \frac{-2a+a^2}{-2a+a^2}$$

$$a^2-a-12=0$$

$$(a-4)(a+3)=0$$

$$\boxed{a=4 \quad a=-3}$$

$$\underline{\text{LCD: } 6}$$

$$9) \frac{2x+3}{6} - \frac{2x+3}{3} = \frac{1}{2} \quad \rightarrow \begin{aligned} 2x+3 - 4x - 6 &= 3 \\ -2x - 3 &= 3 \\ -2x &= \frac{6}{-2} \\ x &= -3 \end{aligned}$$

$$10) \frac{1}{x+3} - \frac{2}{3-x} = \frac{4}{x^2-9} \Rightarrow \frac{1}{x+3} - \frac{-2}{x-3} = \frac{4}{(x+3)(x-3)}$$

$$\underline{\text{LCD: } (x+3)(x-3)}$$

$$\frac{x-3}{(x+3)(x-3)} - \frac{-2(x+3)}{(x+3)(x-3)} = \frac{4}{(x+3)(x-3)}$$

$$x-3 + 2x+6 = 4$$

$$3x+3 = 4$$

$$3x = 1$$

$$\boxed{x = \frac{1}{3}}$$

$$11) 2x^2 = 13x - 15$$

$$2x^2 - 13x + 15 = 0$$

$$a = 2$$

$$b = -13$$

$$c = 15$$

$$x = \frac{-(-13) \pm \sqrt{(-13)^2 - 4(2)(15)}}{2(2)} = \frac{13 \pm \sqrt{49}}{4}$$

$$= \frac{13 \pm 7}{4}$$

$$\frac{13+7}{4} = \frac{20}{4} = \boxed{5}$$

$$\frac{13-7}{4} = \frac{6}{4} = \boxed{\frac{3}{2}}$$

$$12) x^2 - 6x = -21$$

$$x^2 - 6x + 21 = 0$$

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(21)}}{2(1)}$$

$$a=1$$

$$b=-6$$

$$c=21$$

$$x = \frac{6 \pm \sqrt{-48}}{2} = \frac{6 \pm i\sqrt{48}}{2} = \frac{6 \pm 4i\sqrt{3}}{2}$$

$$= \boxed{3 \pm 2i\sqrt{3}}$$

$$13) \frac{2x^2}{2} + \frac{12x}{2} + \frac{6}{2} = 0$$

$$x^2 + 6x + 3 = 0$$

$$x^2 + 6x + \boxed{9} = -3 + \boxed{9}$$

$$\text{Half} = \frac{6}{2} = 3$$

$$\text{Square} = 3^2 = 9$$

$$(x+3)^2 = 6$$

$$x+3 = \pm \sqrt{6}$$

$$\boxed{x = -3 \pm \sqrt{6}}$$

$$14) 2x^2 = 7x - 4$$

$$2x^2 - 7x + 4 = 0$$

$$a=2$$

$$b=-7$$

$$c=4$$

$$x = \frac{-(-7) \pm \sqrt{(-7)^2 - 4(2)(4)}}{2(2)}$$

$$\boxed{x = \frac{7 \pm \sqrt{17}}{4}}$$

15) OMIT

16) OMIT

17) $2y^2 + 3y + 2 = 0$

$a = 2$

$b = 3$

$c = 2$

$$y = \frac{-3 \pm \sqrt{(3)^2 - 4(2)(2)}}{2(2)}$$

$$y = \frac{-3 \pm \sqrt{-7}}{4}$$

$$y = \frac{-3 \pm i\sqrt{7}}{4} = \frac{-3}{4} \pm \frac{i\sqrt{7}}{4}$$

(B)